VULCAN

SERVICE MANUAL



GR35 SHOWN

GR SERIES GAS FRYERS WITH MILLIVOLT CONTROLS

MODEL	ML	MODEL	ML
GR25	126988	GR35F	126998
GR35	126989	GR45F	126999
GR45	126990	GR65F	135534
GR65	126991	GR85F	135535
GR85	126992		

- NOTICE -

This Manual is prepared for the use of trained Vulcan Service Technicians and should not be used by those not properly qualified. If you have attended a Vulcan Service School for this product, you may be qualified to perform all the procedures described in this manual.

This manual is not intended to be all encompassing. If you have not attended a Vulcan Service School for this product, you should read, in its entirety, the repair procedure you wish to perform to determine if you have the necessary tools, instruments and skills required to perform the procedure. Procedures for which you do not have the necessary tools, instruments and skills should be performed by a trained Vulcan Service Technician.

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F25125 (March 2003)

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GENERAL

INTRODUCTION

This Service Manual covers specific service information related to the models listed on the front cover.

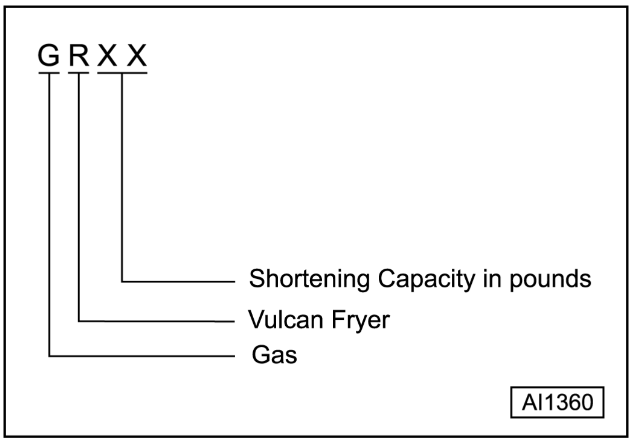
SINGLE FLOOR MODEL OR BATTERY FRYERS

Fryers with the Filter-Ready option installed, use the Mobile Filter. For service information related to the Mobile Filter, refer to F24599 MOBILE FILTERS. Filter-Ready fryers are available as single floor models only.

The information in the GR Series Service Manual also applies to Non-Filter Ready fryers. Non-Filter Ready fryers are available in batteries of two to six.

An RO Frymate (dump station) can be configured in a battery with fryers 15 1/2" or 21" in width.

Model Designations



Models and Features

MODEL	FEATURES			
	FRYER WIDTH (INCHES)	SHORTENING CAPACITY (POUNDS)	FRY TANK	COOKING CONTROL
GR25 [1]	10 1/2	25-30	Full	Thermostat
GR35	15 1/2	35-40	Full	Thermostat
GR45	15 1/2	45-50	Full	Thermostat
GR65	21	65-70	Full	Thermostat
GR85	21	85-90	Full	Thermostat
RO15 (Frymate)	15 1/2			
RO21 (Frymate)	21			
RO21S (Frymate)	21			
NOTE:	1. Available in battery configurations only.			

KLEENSCREEN FILTERING SYSTEM

The new Kleenscreen filtering system has been integrated into the GR Series fryer battery. The filter is housed in a pull-out drawer assembly at the base of the fryer. The filtering components in the drawer include a stainless steel filter tank, crumb-catch basket and a dual element mesh filter screen. With the filter drawer closed, a self-seating oil return line provides the path to return the filtered oil to the fry tank.

This system is designed to provide a thorough and easy method for filtering shortening.

Some of the benefits include:

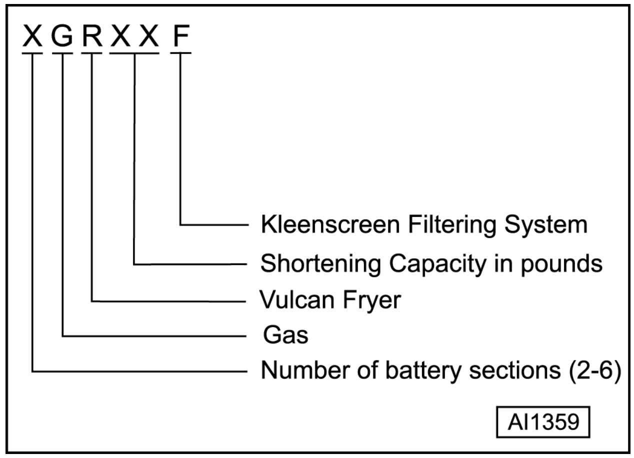
- Self-contained system eliminating the use of external filter equipment.
- Paperless filtering system.
- Easy to clean and low maintenance.

The Kleenscreen fryer battery still utilizes many of the same components as the single floor model and Non-Filter ready battery fryers.

Kleenscreen fryer batteries are available in a minimum of two and a maximum of six fryer sections. The fryer size of each section is identical.

An RO Frymate (dump station) can also be included as one or more of the sections.

Model Designations



Models and Features

MODEL	FEATURES				
	FRYER WIDTH (INCHES)	SHORTENING CAPACITY PER FRYER (POUNDS)	KLEENSCREEN FILTER PAN CAPACITY (POUNDS)	FRY TANK	COOKING CONTROL
2GR35F [1]	31	35-40	80	Full	Thermostat
2GR45F [1]	31	45-50	80	Full	Thermostat
2GR65F [2]	42	65-70	130	Full	Thermostat
2GR85F [2]	42	85-90	130	Full	Thermostat
RO15 (Frymate)	15 1/2				
RO21 (Frymate)	21				
RO21S (Frymate)	21				
NOTES:	1. For each additional fryer section, add 15 1/2" to the width. 2. For each additional fryer section, add 21" to the width.				

SPECIFICATIONS

Electrical

- 120VAC supply for Filter-Ready fryers and Kleenscreen filter models only. The filter pump motor draws approximately 5 amps.

Gas Pressures

Manifold (per fryer section):

- Natural - 4" W.C.
- Propane - 10" W.C.

Building supply pressure (Min):

- Natural - 5" W.C. (7" W.C. battery units)
- Propane - 11" W.C. (12" W.C. battery units)

NOTE: Propane or Natural gases -14" W.C. (Max).

Input BTU Rating

GR SERIES	NO. OF TUBES	BTU/HR/SECTION
GR25, GR25F	2	60,000
GR35, GR35F	3	90,000
GR45, GR45F	4	120,000
GR65, GR65F	5	150,000
GR85, GR85F	5	150,000

TOOLS

Standard

- Standard set of hand tools.
- VOM with AC current tester.

  NOTE: Any quality VOM with a sensitivity of 20,000 ohms per volt can be used.
- Temperature tester (thermocouple type).
- U-Tube Manometer.
- Pipe joint compound suitable for use with propane gas.

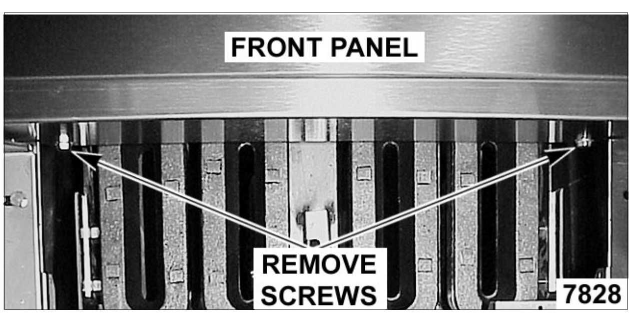
REMOVAL AND REPLACEMENT OF PARTS

FRONT PANEL



WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

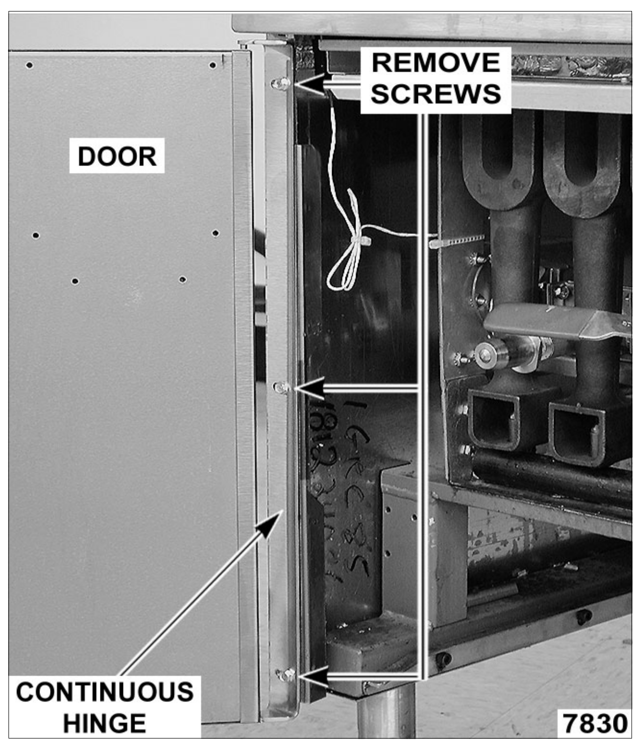
1. Open fryer door and remove screws from front panel.



2. Lift front panel from fryer.
3. Reverse procedure to install.

DOOR

1. Open the fryer door and remove screws securing hinge & door assembly to fryer.



2. When replacing door, install screws and tighten top and bottom screws enough to hold door in place.
3. Close door, check alignment and adjust if necessary.
4. Finish tightening screws to fully secure.

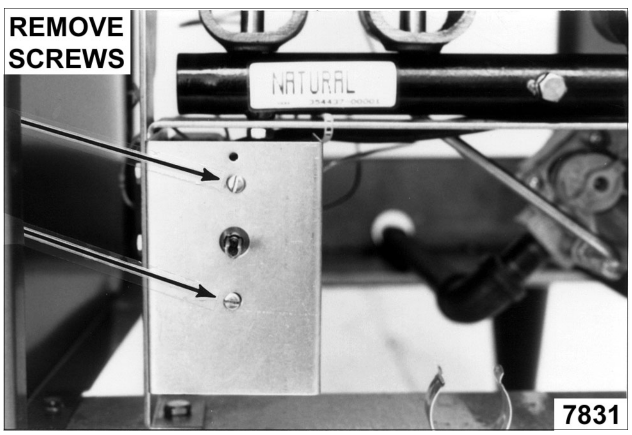
CONTROL THERMOSTAT



WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

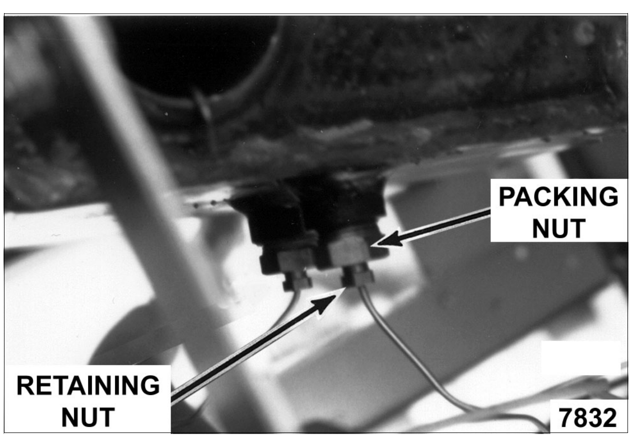
CAUTION: Do not sharply bend and kink the capillary tube or damage may occur.

1. Drain shortening from fry tank.
2. Remove burners (as necessary) as outlined under MAIN BURNERS.
3. Remove knob from control thermostat shaft then remove control thermostat from mounting bracket.

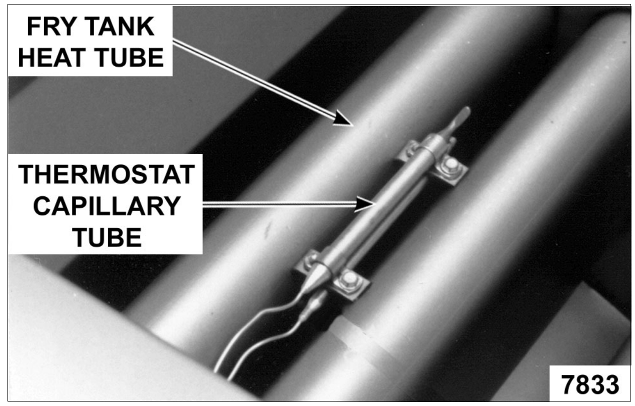


NON FILTER READY SHOWN

4. Disconnect lead wires from control thermostat.
5. Remove the capillary tube retaining and packing nuts, from the bottom of fry tank.



6. Remove screws securing capillary tube mounting clips to the fry tank heat tube then remove capillary tube.



7. Reverse procedure to install and check for proper operation.

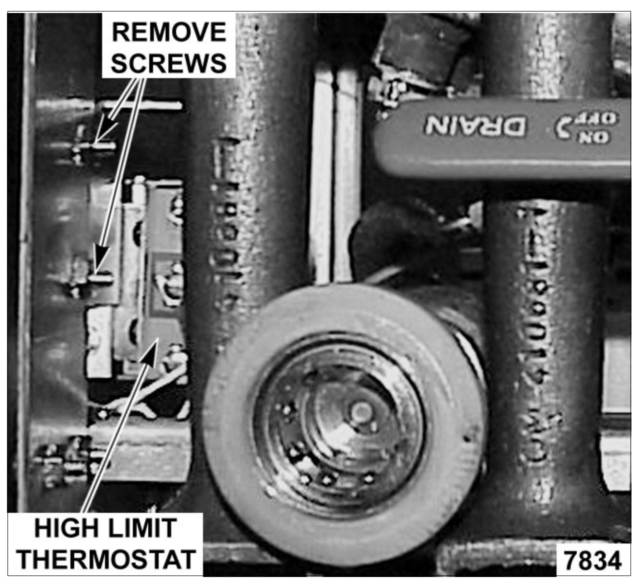
HIGH LIMIT THERMOSTAT



WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

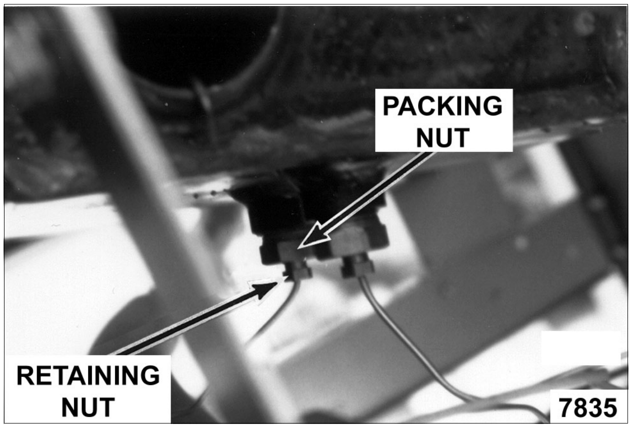
CAUTION: Do not sharply bend and kink the capillary tube or damage may occur.

1. Drain shortening from fry tank.
2. Remove burners (as necessary) as outlined under MAIN BURNERS.
3. Remove screws securing the high limit thermostat to mounting bracket.

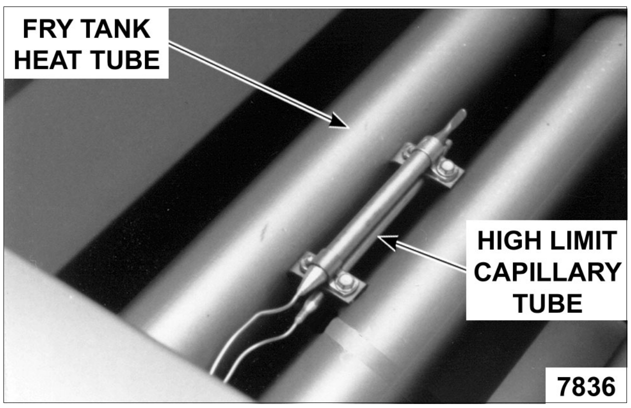


4. Disconnect lead wires from high limit thermostat.

5. Remove the capillary tube retaining and packing nuts, from the bottom of fry tank.



6. Remove screws securing capillary tube mounting clips to the fry tank heat tube then remove capillary tube.



7. Reverse procedure to install.

MAIN BURNERS



WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

WARNING: SHUT OFF THE GAS BEFORE SERVICING THE UNIT.

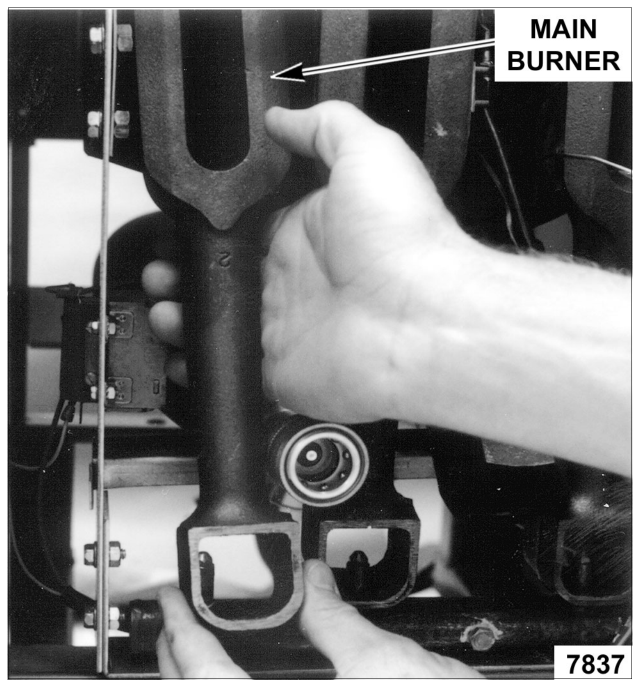
1. Open fryer door.
2. Remove main burner shipping ties (if installed).

NOTE: All shipping ties should be removed during installation. Do not replace for normal operation.

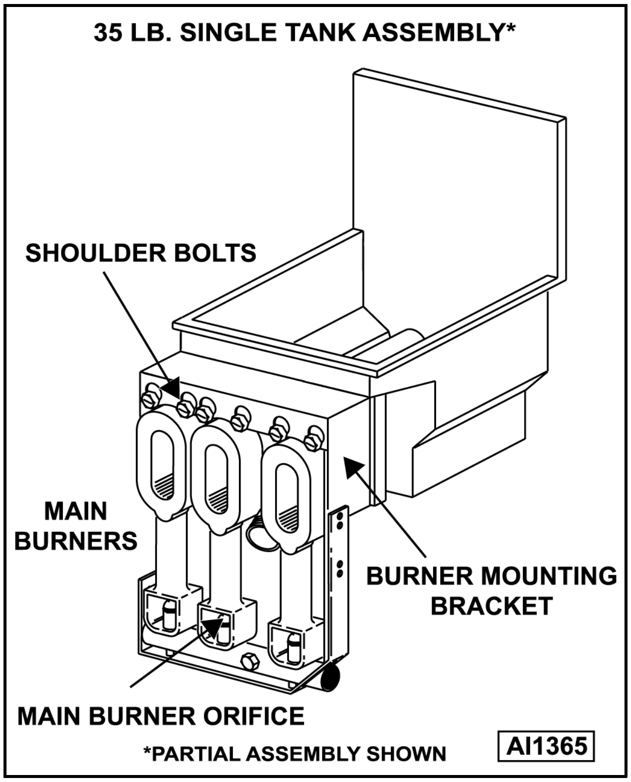


3. Lift main burner up and tilt the top of burner toward fry tank until it clears the gas orifice at the bottom.

   A. Lift main burner from fryer.



NOTE: The main burners mount to the fryers' burner mounting bracket by shoulder bolts that rest in the keyway slot.



4. Reverse procedure to install.

MAIN BURNER ORIFICE

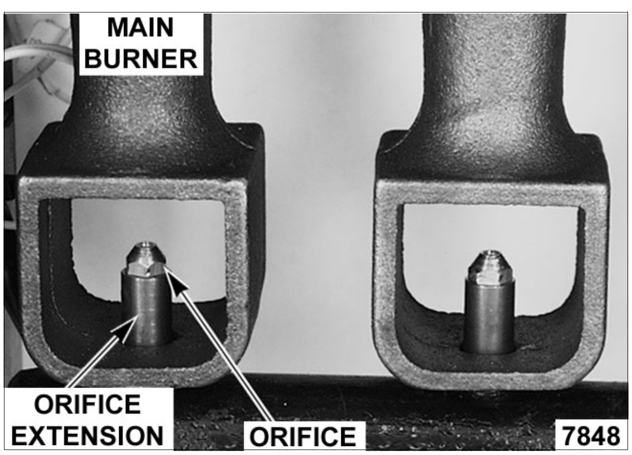


WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

WARNING: SHUT OFF THE GAS BEFORE SERVICING THE UNIT.

1. Remove main burner orifice from orifice extension.

NOTE: When installing, do not over tighten the orifice or damage to the threads may occur.



2. Reverse procedure to install.

GAS COMBINATION VALVE



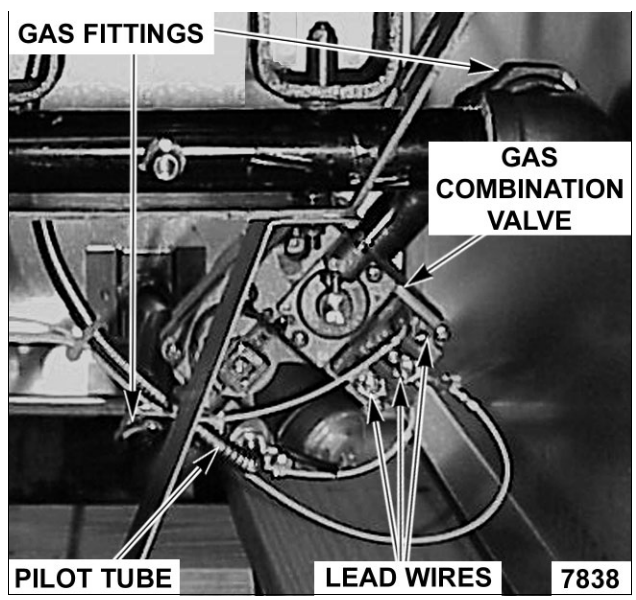
WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

WARNING: SHUT OFF THE GAS BEFORE SERVICING THE UNIT.

WARNING: ALL GAS JOINTS DISTURBED DURING SERVICING MUST BE CHECKED FOR LEAKS. CHECK WITH A SOAP AND WATER SOLUTION (BUBBLES). DO NOT USE AN OPEN FLAME.

NOTE: Gas combination valves are not serviceable and should not be disassembled. Once the problem has been isolated to this control, replace it. Do not attempt to repair the assembly.

1. Remove burners (as necessary) as outlined under MAIN BURNERS.
2. Disconnect lead wires from gas combination valve.
3. On filter ready and Kleenscreen fryers only, remove cotter pin securing handle to gas combination valve on/off knob. Pull handle (with gas combination valve knob bracket attached) away from valve assembly.
4. Disconnect pilot tube.
5. Separate gas line fittings then remove gas combination valve assembly.



NON FILTER READY SHOWN

NOTE: Remove fittings and piping from gas combination valve and install (in same orientation) on the replacement valve.

6. Reverse procedure to install and check for proper operation.

PILOT BURNER

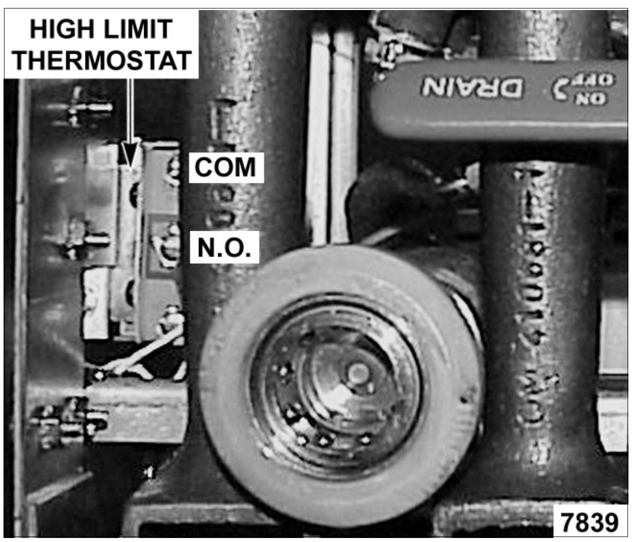


WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

WARNING: SHUT OFF THE GAS BEFORE SERVICING THE UNIT.

WARNING: ALL GAS JOINTS DISTURBED DURING SERVICING MUST BE CHECKED FOR LEAKS. CHECK WITH A SOAP AND WATER SOLUTION (BUBBLES). DO NOT USE AN OPEN FLAME.

1. Remove burners (as necessary) as outlined under MAIN BURNERS.
2. Disconnect thermopile lead wires from N.O. and COM terminals on the high limit thermostat.

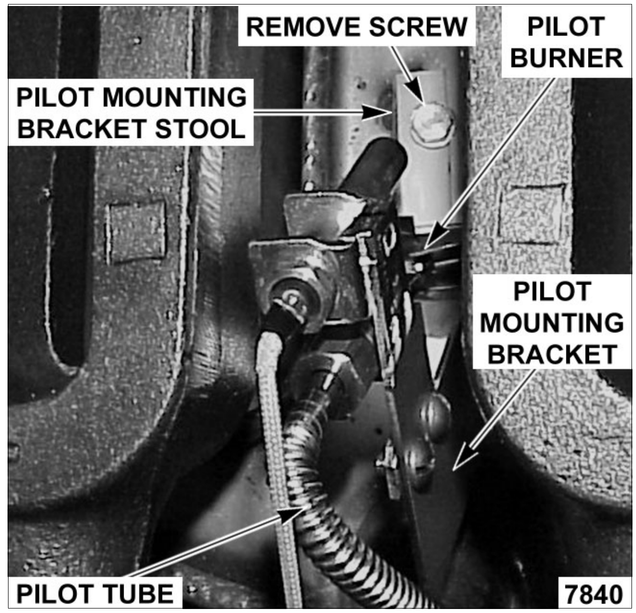


3. Disconnect pilot tube from pilot burner.

NOTE: With pilot tube disconnected from pilot burner, the pilot orifice is accessible for inspection or cleaning.

CAUTION: If orifice is clogged with debris, clean with air or liquid only.

4. Remove pilot burner from pilot mounting bracket stool (on fry tank).
5. Remove pilot burner from pilot mounting bracket.



6. Reverse procedure to install and check for proper operation.

THERMOPILE

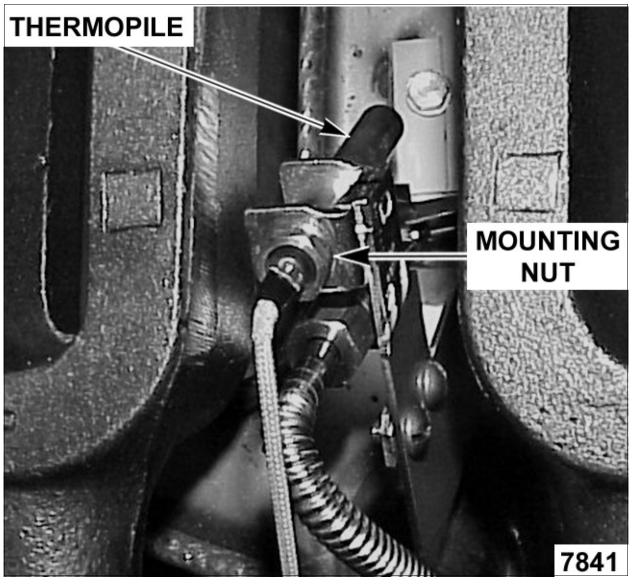


WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

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WARNING: ALL GAS JOINTS DISTURBED DURING SERVICING MUST BE CHECKED FOR LEAKS. CHECK WITH A SOAP AND WATER SOLUTION (BUBBLES). DO NOT USE AN OPEN FLAME.

1. Remove pilot burner as outlined under PILOT BURNER.
2. Remove mounting nut securing thermopile to pilot burner.



3. Reverse procedure to install and check for proper operation.

FRY TANK ASSEMBLY



WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

WARNING: SHUT OFF THE GAS BEFORE SERVICING THE UNIT.

WARNING: ALL GAS JOINTS DISTURBED DURING SERVICING MUST BE CHECKED FOR LEAKS. CHECK WITH A SOAP AND WATER SOLUTION (BUBBLES). DO NOT USE AN OPEN FLAME.

1. Drain shortening from fry tank.
2. Disconnect the gas supply line to allow access to fryer from all sides.
3. Remove fry baskets, crumb screen and basket hanger.

NOTE: If the fryer is a battery section, remove grease strip and split the silicone seal between the fryer section tanks with a utility knife.

4. Remove front panel as outlined under FRONT PANEL.
5. On Kleenscreen fryer sections only, remove bolts securing the drain pipe flange to the manual drain valve.
6. Remove main burners as outlined under MAIN BURNERS.
7. Disconnect lead wires and pilot tube from the gas combination valve.
8. Remove pilot burner as outlined under PILOT BURNER.
9. Remove control thermostat as outlined under CONTROL THERMOSTAT.
10. Remove high limit thermostat as outlined under HIGH LIMIT THERMOSTAT.
11. Remove gas manifold and hanger assembly from the fryer.
    A. For fryer sections above the filter drawer assembly on battery fryers or single floor model fryers (filter ready), remove mounting nuts securing gas manifold and hanger assembly to the fryer’s base frame.
    B. For other fryer sections in a battery and for non-filter ready fryers, remove mounting nuts securing gas manifold and hanger assembly to the V shaped support bracket.
12. On Kleenscreen and filter ready fryers only, separate the oil return line (hose or flexible tubing) fitting at the elbow.
13. Separate gas line fitting at the inlet side of the gas combination valve.
14. Remove bolts securing gas line support bracket at the left side of gas manifold and hanger assembly. Allow gas line support bracket to swing out of way then replace bolts in the frame. Hand tighten only.
15. Remove screws securing the top of fry tank to the flue wrap.

CAUTION: Use care when lifting fry tank assemblies from the fryer body. Exterior surfaces of the fryer can be slippery and the assemblies are heavy.

16. Grasp the fry tank at the top (by flue) and front lip, then lift fry tank assembly from the fryer body. Place the assembly on floor or table for removal of the remaining components.

NOTE: If side access is not available, lift fry tank assembly from the front of the fryer while rotating the assembly upwards and toward the front.

17. On Kleenscreen fryers only, remove filter valve assembly (as necessary) and oil return line piping from fryer. If removing left side fry tank above filter drawer assembly, disconnect oil line and remove discard valve assembly from fryer.
18. Remove bolts securing gas manifold hanger assembly to the fry tank.
19. Remove screws securing flue box to fry tank then remove flue box.
20. Remove drain valve.

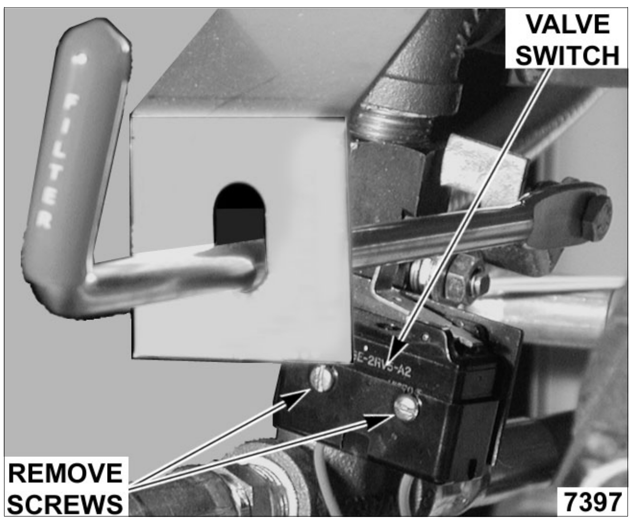
21. Reverse procedure to install all the parts removed from original fry tank onto replacement fry tank, then install the assembly.

FILTER VALVE AND DISCARD VALVE SWITCHES



WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

1. Open the door to the fryer section being serviced.
2. Remove burners (as necessary) as outlined under MAIN BURNERS.
3. Disconnect lead wire connector (2 pin) from the appropriate switch.
4. Remove switch mounting screws.



5. Reverse procedure to install and check for proper operation.

NOTE: Switches are not adjustable.

PUMP AND MOTOR



WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

1. Open both fryer cabinet doors above the filter tank drawer.
2. Pull the filter drawer out, remove the filter tank assembly and push the tank support arms back underneath the fryer.

NOTE: The remaining steps are written for front removal of the pump assembly. If access to the back of the fryer is available, it may be easier to remove the pump from the rear.

3. Remove burners from the right side fryer section above filter tank drawer as outlined under MAIN BURNERS.
4. Disconnect the electrical connection to the motor.
5. Separate the swivel hose connections at the pump.

NOTE: When viewed from pump end, the right side is the intake port and the left side is the discharge port.

6. Remove motor mounting bolts.
7. Remove the motor and pump (pipe fittings attached) from the fryer.
   A. If replacing the pump and motor, remove the existing pipe assemblies and reuse.
8. Reverse procedure to install.

NOTE: Ensure the rubber vibration pad or the grommets are installed under the motor mounting plate.

SERVICE PROCEDURES AND ADJUSTMENTS

WARNING: CERTAIN PROCEDURES IN THIS SECTION REQUIRE ELECTRICAL TEST OR MEASUREMENTS WHILE POWER IS APPLIED TO THE MACHINE. EXERCISE EXTREME CAUTION AT ALL TIMES. IF TEST POINTS ARE NOT EASILY ACCESSIBLE, DISCONNECT POWER AND FOLLOW LOCKOUT / TAGOUT PROCEDURES, ATTACH TEST EQUIPMENT AND REAPPLY POWER TO TEST.

CONTROL THERMOSTAT CALIBRATION

NOTE: Check the level of shortening in fry tank before proceeding. When the oil temperature is within normal operating range (325˚F - 375˚F), the level must be between the MIN & MAX fill lines.

1. Place a thermocouple in the geometric center of the fry tank 1" below the oil surface.
2. Set control thermostat to 350°F.
3. Allow the shortening temperature to stabilize (normally 3 cycles).
4. Record the temperature reading from the meter, at which the main burners turn off and turn on for at least two complete heating cycles.
5. Calculate the **differential** temperature by subtracting the temperature reading when the main burners turn off to the temperature reading when the main burners turn on.

   [Differential = Temp. (burners off) - Temp. (burners on)]

   Example: 360˚ (burners off) - 340˚ (burners on) = 20˚F.

   The differential calculated should be less than 20˚F.

   A. If the differential is less than 20˚F, the control thermostat is functioning properly.

   B. If the differential is more than 20˚F, the control thermostat is malfunctioning.

      1) Install a replacement control thermostat as outlined under CONTROL THERMOSTAT in REMOVAL AND REPLACEMENT OF PARTS.

6. Calculate the **average** temperature by adding the temperature reading when the main burners turn off to the temperature reading when the main burners turn on and divide this answer by 2.

   [Temp. (burners off) + Temp. (burners on)] ÷ 2 = Average Temp.

   Example: 360˚ + 340˚ ÷ 2 = 350˚F.

   The average temperature should be 350°F (± 10°F).

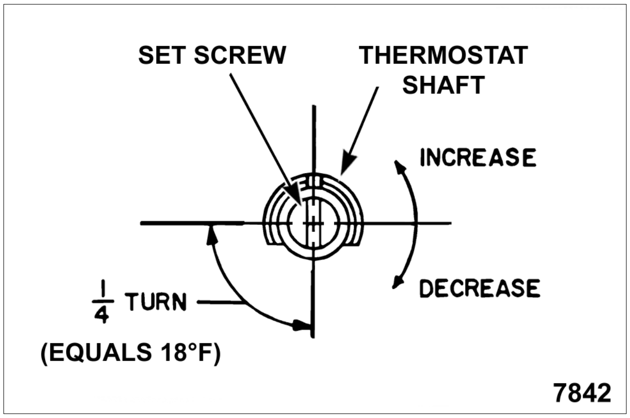
   A. If the average temperature reading is within tolerance, the control thermostat is properly calibrated.

   B. If the average temperature reading is out of tolerance, continue with procedure.

7. To adjust:

   A. Remove control thermostat knob.

   B. Hold control thermostat shaft and turn the inner set screw clockwise to decrease temperature or counterclockwise to increase temperature (1/4 turn = 18˚F).



   C. Replace control thermostat knob and repeat step 6 for up to three attempts. Allow the main burners to cycle at least two times between adjustments before performing the calculation.

      1) When calibration is successful, remove control thermostat knob and apply a non-permanent adhesive material to set screw head to secure from rotation.

      2) Replace control thermostat knob.

8. If the above adjustment cannot be obtained, install a replacement control thermostat as outlined under CONTROL THERMOSTAT in REMOVAL AND REPLACEMENT OF PARTS.

GAS MANIFOLD PRESSURE ADJUSTMENT

WARNING: SHUT OFF THE GAS SUPPLY BEFORE SERVICING THE UNIT.

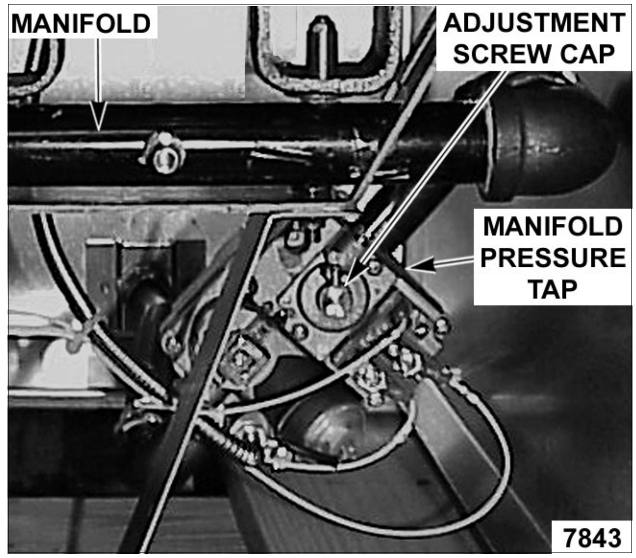
GAS PRESSURE (INCHES W.C.)				
GAS TYPE	MANIFOLD	LINE		
		RECOMMENDED	MIN	MAX
Natural	4	7	5	14
Propane	10	11	11	

NOTE: If the incoming line pressure is <u>less</u> than the minimum stated, then the manifold pressure cannot be set correctly.

1. Open the door and turn gas combination valve knob/extension arm to off.
2. Remove the 1/8" NPT plug (pressure tap) on the outlet side of the valve and attach a manometer.

NOTE: Gas manifold pressure can also be measured at the pressure tap in the manifold. On Kleenscreen battery fryers only, the drain pipe may need to be removed for access.

3. Turn the gas supply on.
4. Light the pilot burner and turn the gas combination valve knob/extension arm to on.
5. Set control thermostat to call for heat and verify the main burners light.
6. Observe the manometer pressure reading and compare to the pressure chart near the end of this procedure.
   A. If other appliances are connected to the same gas line, turn them all on and check manometer pressure reading again. If a pressure drop of 1/2" water column or more is observed, then the gas supply needs to be checked by the gas line installer or the local gas company for adequate sizing.
   B. If adjustment is necessary, continue with procedure.
7. Remove the adjustment screw cap to access the pressure adjustment screw.



NON FILTER READY SHOWN

   A. To increase pressure, turn the screw <u>clockwise</u>. To decrease pressure, turn the screw <u>counterclockwise</u>.

NOTE: Accurate gas pressure adjustments can only be made with the gas on and the main burners lit.

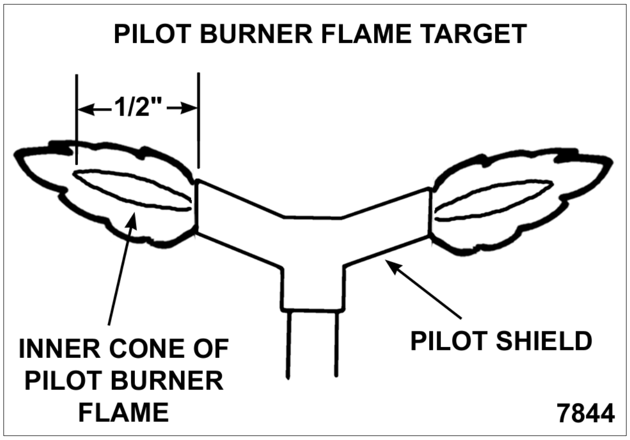
8. Set pressure as outlined in gas pressure table.
9. Once the correct pressure has been set, turn the gas combination valve knob/extension arm to off and shut off the gas supply.
10. Replace the adjustment screw cap and 1/8" NPT plug (pressure tap) on the outlet side of the valve.
11. Check fryer for proper operation.

PILOT BURNER FLAME ADJUSTMENT

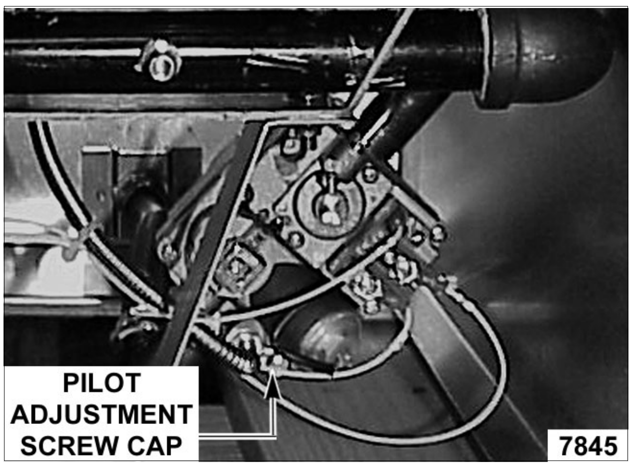
NOTE: Verify the proper gas type (natural or propane) is being supplied to the fryer before proceeding.

1. Turn control thermostat to off.
2. Light pilot burner and leave gas combination valve knob/extension arm in the pilot position. Allow pilot to burn for 3-4 minutes to stabilize flame.
   A. If pilot burner is not lighting or does not remain lit when the gas combination valve knob/extension arm is released, see TROUBLESHOOTING. Wait 5 minutes between pilot burner lighting attempts for unburned gas to vent.
3. Verify the inner cone of pilot burner flame is extending approximately 1/2" beyond the outer edges of the pilot shield.

A. If adjustment is necessary, continue with procedure.



4. Remove the adjustment screw cap from the gas combination valve.



NON FILTER READY SHOWN

A. To increase pilot flame, turn the screw counterclockwise. To decrease pilot flame, turn the screw clockwise.

5. With the pilot burner lit, turn gas combination valve knob/extension arm to on and set the control thermostat to call for heat.

A. If main burners do not light or pilot burner goes out, proceed to MILLIVOLT CONTROLS TEST.

MILLIVOLT CONTROLS TEST

1. Verify millivolt control circuit wiring is correct and connections are clean and secure.
2. Verify pilot burner flame is adjusted properly as outlined under PILOT BURNER FLAME ADJUSTMENT.
3. With control thermostat off and gas combination valve knob/extension arm in the pilot position, allow pilot to burn for 3-4 minutes to stabilize voltage output from thermopile.
4. Verify thermopile output voltage.

A. Set VOM to DC millivolt scale and connect meter leads to N.O. and COM terminals on the high limit thermostat.

1) If 450 millivolts or greater is measured, the thermopile is functioning properly. Continue with test.

2) If less than 450 millivolts is measured, install a replacement thermopile as outlined under THERMOPILE in REMOVAL AND REPLACEMENT OF PARTS.

5. Turn gas combination valve knob/extension arm to on and set the control thermostat to call for heat.
6. Verify main burners light and remain lit.

A. If main burners operate as described, the millivolt controls are functioning properly.

B. If main burners do not light, continue with test.

7. Verify control thermostat contacts are closing.

A. Connect meter leads to the TH terminal on gas combination valve and COM terminal on the high limit thermostat.

1) If 150 millivolts or greater is measured, control thermostat is functioning properly. Replace gas combination valve as outlined under GAS COMBINATION VALVE in REMOVAL AND REPLACEMENT OF PARTS.

ELECTRICAL OPERATION

COMPONENT FUNCTION

FRYER CONTROLS

Control Thermostat . . . . Regulates shortening temperature at the selected set point. Temperature range from off to 200˚F thru 400˚F.

Thermopile . . . . When heated by the pilot burner flame, generates DC millivolts to energize pilot valve coil and main valve coil on the gas combination valve.

Gas Combination Valve . . . . Allows gas flow to the pilot when pilot valve coil is energized; and gas flow to the main burners when main valve coil is energized. Also, regulates the gas manifold pressure.

High Limit Thermostat . . . . Prevents the shortening from reaching temperatures over 465°F (auto reset).

KLEENSCREEN FILTER CONTROLS

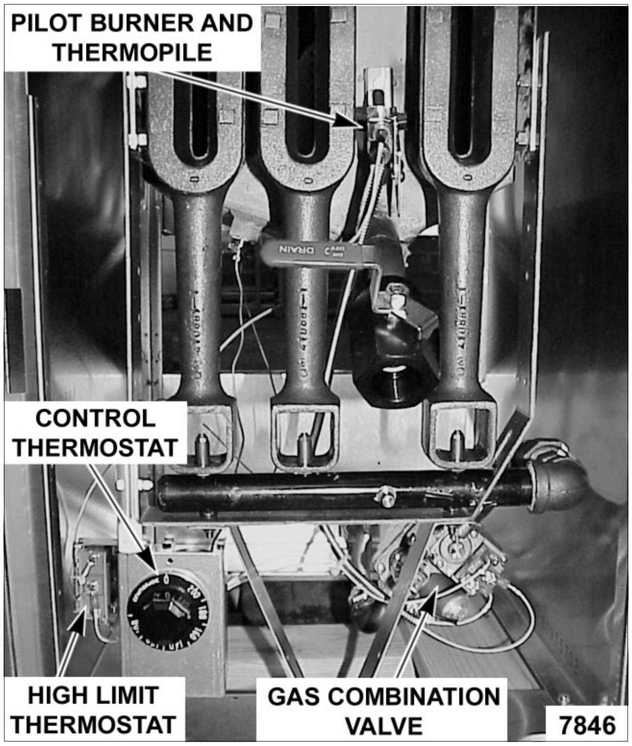
Filter Power Switch . . . . Supplies 120VAC to pump motor. Filter valve switch or discard valve switch must be closed (valve handle extended).

Pump Motor . . . . Operates pump to circulate shortening through filtering system.

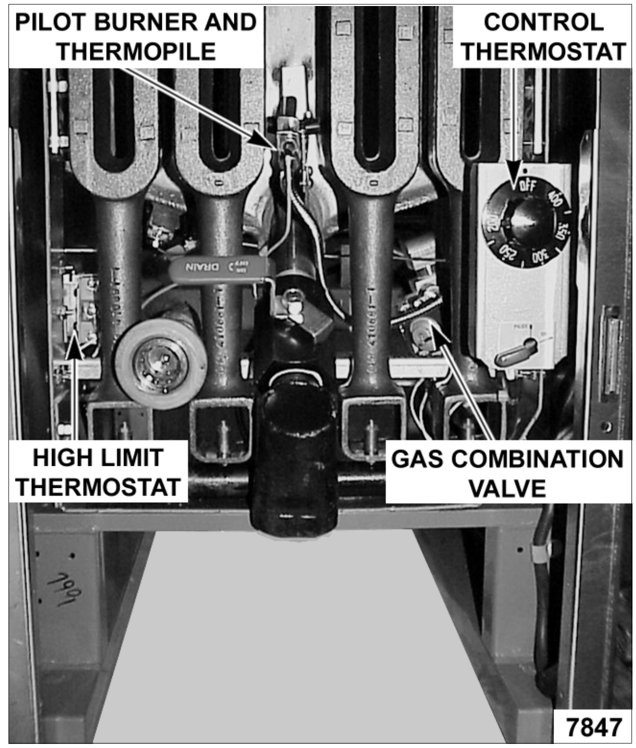
Filter Valve Switch . . . . Energizes pump motor to filter the shortening when the N.O. switch contacts are closed (valve handle extended); and filter power switch is turned on.

Discard Valve Switch . . . . Energizes pump motor to discard the shortening from filter tank when the N.O. switch contacts are closed (valve handle extended); and filter power switch is turned on.

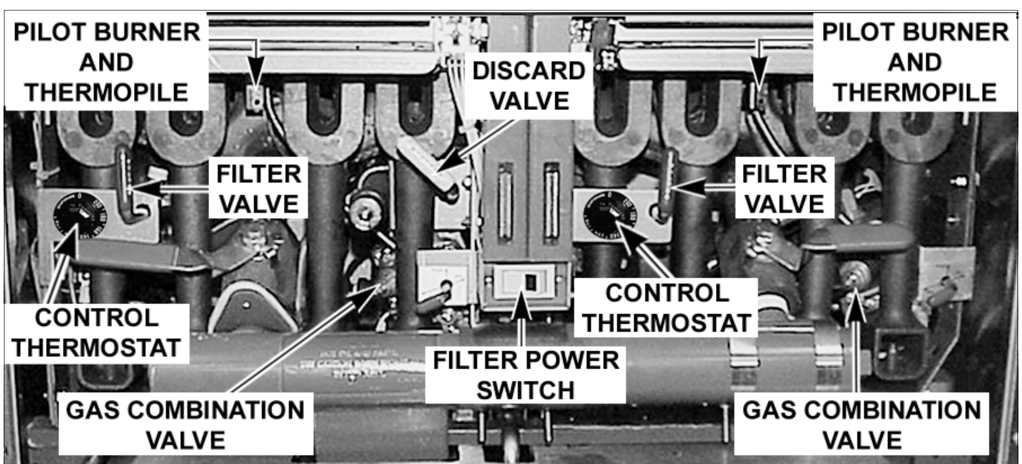
COMPONENT LOCATION



GR35 NON FILTER READY SHOWN



GR45 FILTER READY SHOWN



* PUMP MOTOR LOCATION - RIGHT SIDE FRYER SECTION ABOVE FILTER DRAWER.
* JUNCTION BOX LOCATION - LEFT FRYER SECTION AT THE REAR. 7826

2GR45F KLEENSCREEN FRYER BATTERY SHOWN

SEQUENCE OF OPERATION

Millivolt Controls

Refer to schematic diagram 7825.

1. Conditions.
   - A. Gas shutoff valve(s) on and gas combination valve knob/extension arm in the on position.
   - B. Shortening at proper level in fry tank and below last set point temperature used.
   - C. Pilot lit.
     - 1) Pilot valve coil is energized on gas combination valve and pilot valve opens for gas flow to pilot burner.

     NOTE: Pilot flame must be sufficient to generate 450 millivolts DC (minimum) from thermopile.
   - D. Main valve coil on combination valve not energized (valve closed).
   - E. Control thermostat off.
   - F. High limit thermostat closed.
2. Set control thermostat to call for heat.
   - A. Main valve coil on gas combination valve is energized and main valve opens for gas flow to main burners.
     - 1) Main burners light.

     NOTE: As long as the millivolts from thermopile remain sufficient to keep the pilot valve coil energized, and the control thermostat is calling for heat, the main gas valve stays open.
3. Shortening reaches set temperature and control thermostat opens.
   - A. Main gas valve coil de-energized and main valve closes.
     - 1) Gas flow stops and main burners go out.
4. Control thermostat cycles main burners until thermostat is turned to off; gas valve knob/extension arm is turned to pilot or off.

Kleenscreen Filtering System

Refer to wiring diagram 7850. Refer to Installation & Operation manual for specific instructions on filtering.

NOTE: The filter valve handle and the discard valve handle are connected to a mechanical valve and switch assembly to route the flow of oil in the filtering system and supply power to the pump motor.

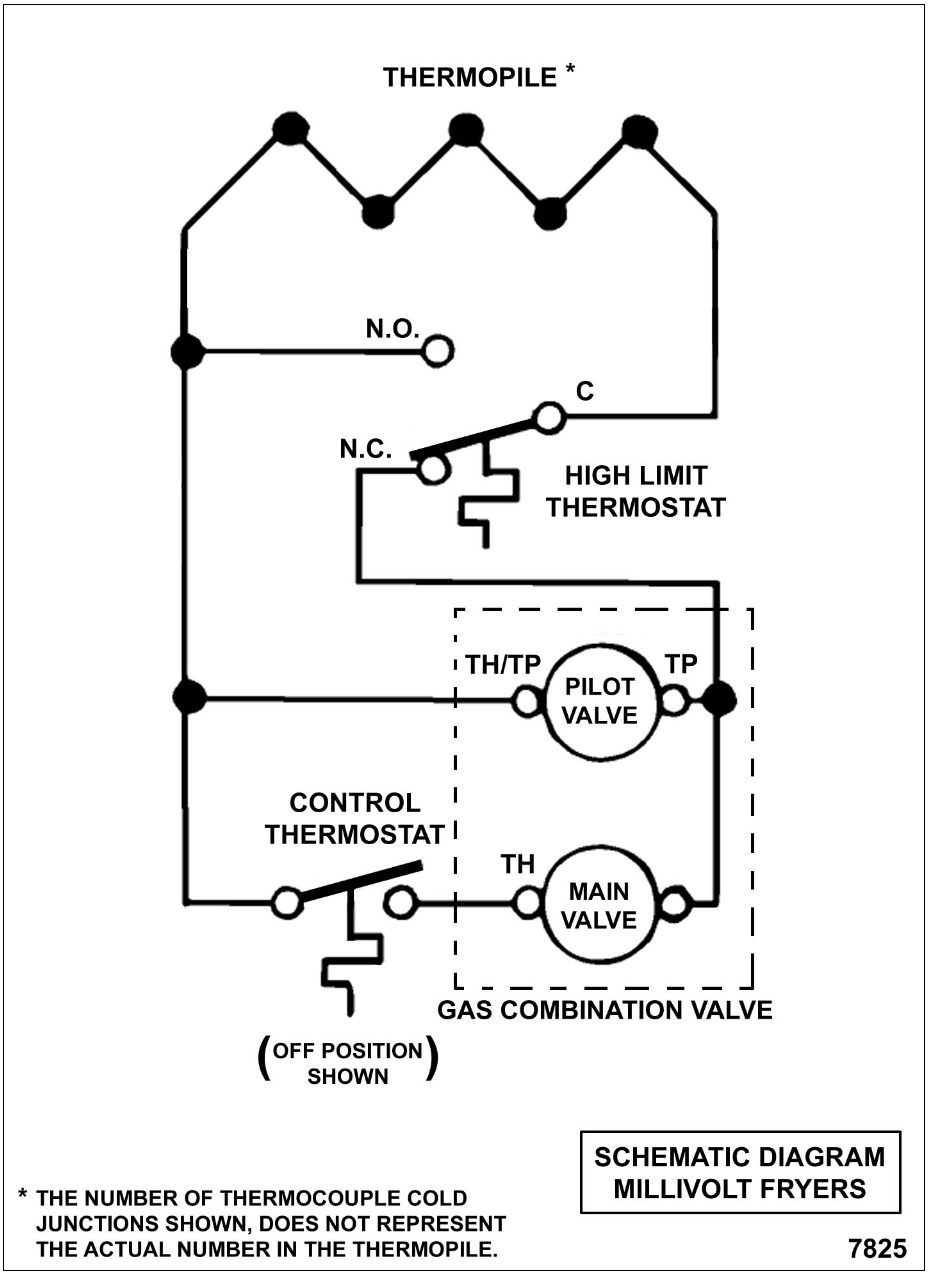
1. Conditions
   - A. Fryer connected to correct supply voltage and is properly grounded.
   - B. Shortening between 300˚F and 350˚F.

   NOTE: Oil should not be filtered outside of this temperature range. At lower temperatures the oil is thicker which may increase filtering time and place a greater load on the pump. At higher oil temperatures, oil seal life is decreased.
   - C. Control thermostat off.

   NOTE: Control thermostat must remain off during filtering.
   - D. Filter drawer assembly installed properly.
   - E. Filter power switch turned off.
   - F. Filter valve handle retracted.
     - 1) Filter valve switch N.O. contacts open.
   - G. Discard valve handle retracted.
     - 1) Discard valve switch N.O. contacts open.
2. Open the drain valve to the fryer section in need of filtering and drain the shortening into filter tank.
3. Turn filter power switch on.
   - A. Switch pilot light comes on.
4. Extend filter valve handle of the same fryer section.
   - A. Filter valve switch N.O. contacts close.
     - 1) Power supplied to pump motor.
   - B. Pump motor circulates oil through filter until power is removed.
5. When the oil filtering process is completed, close the manual drain valve to the fryer and allow the fry tank to refill.
   - A. When all filtered oil is returned to the fryer, retract the filter valve handle.
     - 1) Power is removed from pump motor.
6. Turn filter power switch off.

SCHEMATIC DIAGRAM

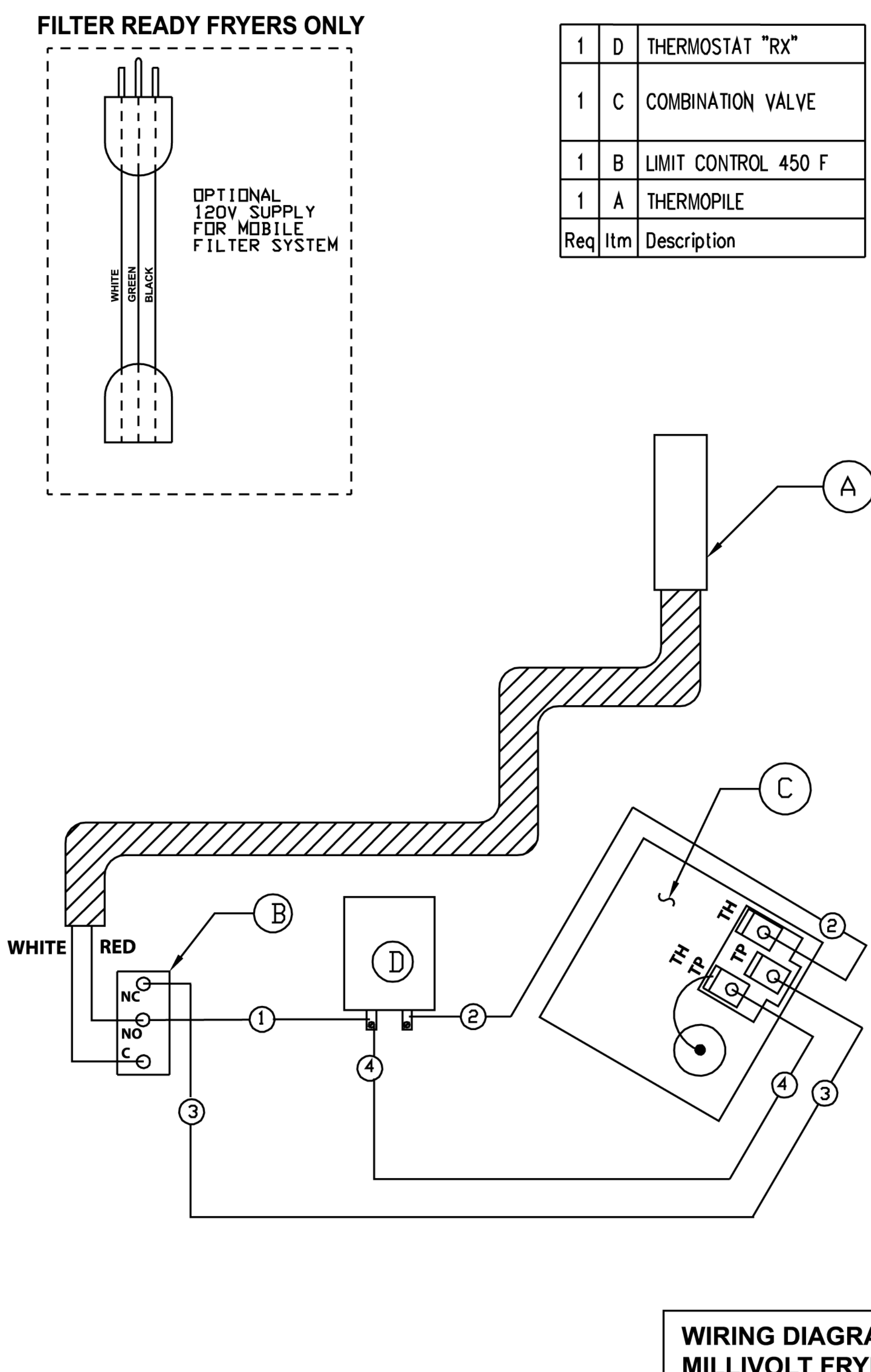
Millivolt Controls



WIRING DIAGRAMS

Millivolt Controls

Req	Itm	Description
1	D	THERMOSTAT "RX"
1	C	COMBINATION VALVE
1	B	LIMIT CONTROL 450 F
1	A	THERMOPILE

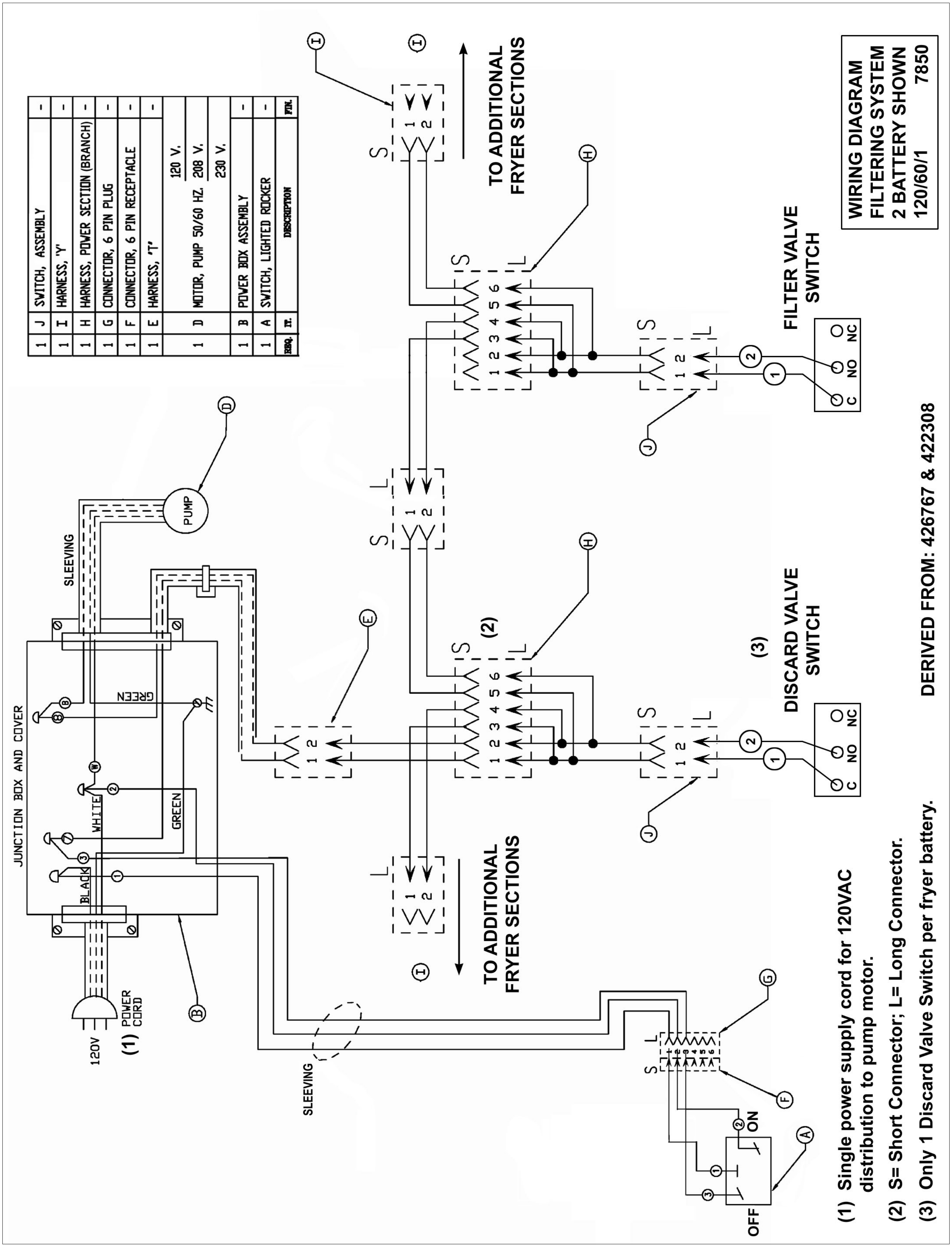


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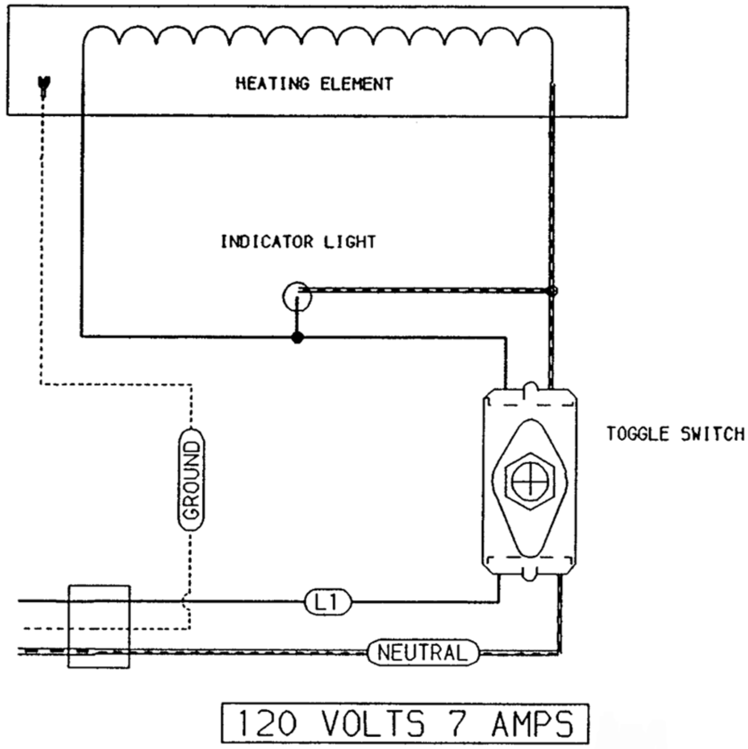
WIRING DIAGRAM MILLIVOLT FRYERS

AI1358

Junction Box, Kleenscreen Filtering System



Frymate (Dump Station)



815

TROUBLESHOOTING

ALL MODELS

SYMPTOMS	POSSIBLE CAUSES
Pilot burner will not light.	1. Gas supply off. 2. High limit thermostat open or malfunction. 3. Incorrect gas type. 4. Pilot burner flame adjustment too low. 5. Pilot burner orifice obstructed or incorrect. 6. Gas combination valve malfunction.
Pilot burner lights but will not maintain flame.	1. Pilot burner flame adjustment too low. 2. Pilot burner orifice obstructed or incorrect. 3. Thermopile malfunction. 4. Insufficient gas pressure. 5. High limit thermostat malfunction. 6. Gas combination valve malfunction.
Pilot burner adjusted properly but flame fluctuates or goes out.	1. Insufficient gas pressure due to other equipment operating on same line. 2. Excessive drafts. A. Vent hood not adjusted properly. B. Fryer door open or removed.
Main burner(s) light but will not maintain flame.	1. Insufficient gas pressure. 2. Main burner(s) gas orifice obstructed or incorrect. 3. Thermopile malfunction 4. Main burner(s) malfunction. 5. Gas combination valve malfunction.
Fryer does not heat, pilot burner lit.	1. Control thermostat off or malfunctioning. 2. Gas combination valve malfunction. 3. Wiring connections loose or wiring malfunction.
Excessive or low heat.	1. Control thermostat calibration or malfunction. 2. Gas pressure incorrect. 3. Main burner(s) gas orifice obstructed or incorrect. 4. Flue obstructed. 5. Vent hood not adjusted properly. 6. Fryer load capacity exceeded.
High limit thermostat shutting off main burners.	1. Shortening level below minimum fill line. 2. Control thermostat malfunction. 3. High limit thermostat malfunction.
Main burners light when control thermostat is turned off.	1. Control thermostat malfunction. 2. Control thermostat terminals shorted or lead wire grounded. 3. Gas combination valve malfunction.

FRYMATE (DUMP STATION) WITH OPTIONAL HEATER

SYMPTOM	POSSIBLE CAUSES
No heat.	1. Unplugged. 2. Power switch off or inoperative. 3. Main circuit breaker off or open. 4. Malfunctioning heat assembly.

KLEENSCREEN FILTERING SYSTEM

SYMPTOM	POSSIBLE CAUSES
Oil not filtering, pump motor is on.	1. Filter screen plugged. 2. Clog in filter system lines. **NOTE:** When all filtered oil is returned to the fry tank and filter power switch is off, open the filter drawer approximately 1". Allow the remaining shortening in the line to drain into the filter tank to prevent possible clogging after the shortening cools and solidifies. Close the filter drawer when complete. 3. Shortening below 300˚F (too thick). 4. Filter valve switch malfunction. 5. Filter valve mechanical malfunction. 6. Pump is inoperative.
Shortening not discarding, pump motor on.	1. Filter screen plugged. 2. Clog in filter system lines. **NOTE:** When all filtered oil is returned to the fry tank and filter power switch is off, open the filter drawer approximately 1". Allow the remaining shortening in the line to drain into the filter tank to prevent possible clogging after the shortening cools and solidifies. Close the filter drawer when complete. 3. Shortening below 300˚F (too thick). 4. Discard valve switch malfunction. 5. Discard valve mechanical malfunction. 6. Discard hose connection not fully engaged. 7. Pump is inoperative.
Pump motor is not running.	1. Filter power switch inoperative. 2. Filter/discard handle not extended. 3. Filter/discard valve switch malfunction. 4. Filter relay malfunction. 5. Pump motor inoperative.

CONDENSED SPARE PARTS LIST

KLEENSCREEN FILTER

PART NUMBER	DESCRIPTION	NOTES
411496-B4	Lighted Rocker Switch, Filter	
417792-1	Pump and Motor Assy, Filter (120VAC)	

GR SERIES GAS FRYERS WITH MILLIVOLT CONTROL

PART NUMBER	DESCRIPTION	NOTES
419999-2	Thermostat, Reed Switch	
419670-2	High Limit Thermostat (w/stuffing box)	
410839-4	Thermopile, Millivolt (manual ign.)	
410841-22	Gas Valve (NAT)	
410841-23	Gas Valve (LP)	
412212-7	Pilot (NAT)	
412212-2	Pilot (LP)	

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